

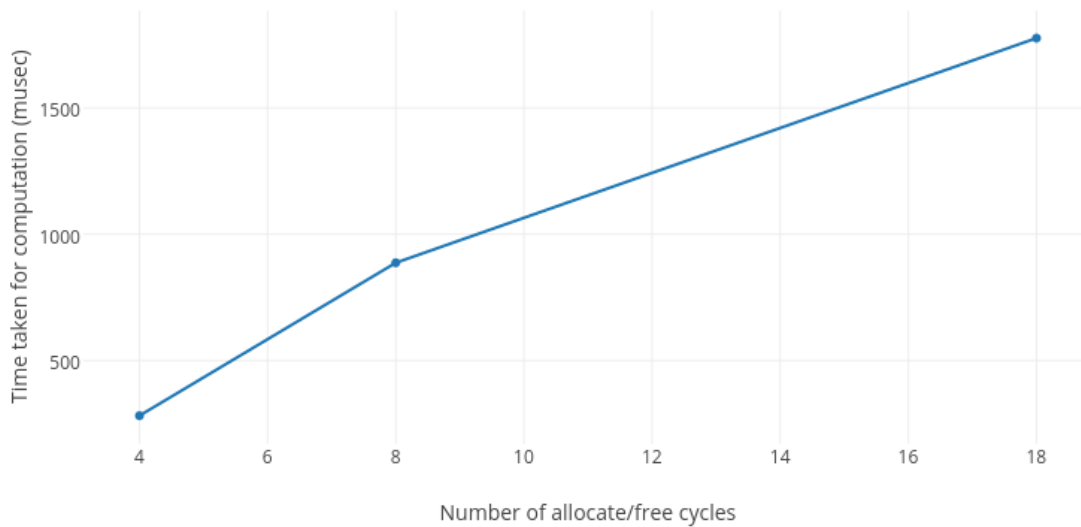
## Analysis for Machine Problem 2: A Simple Memory Allocator

### Identify at least one point to improve the performance of the BBS, and explain why.

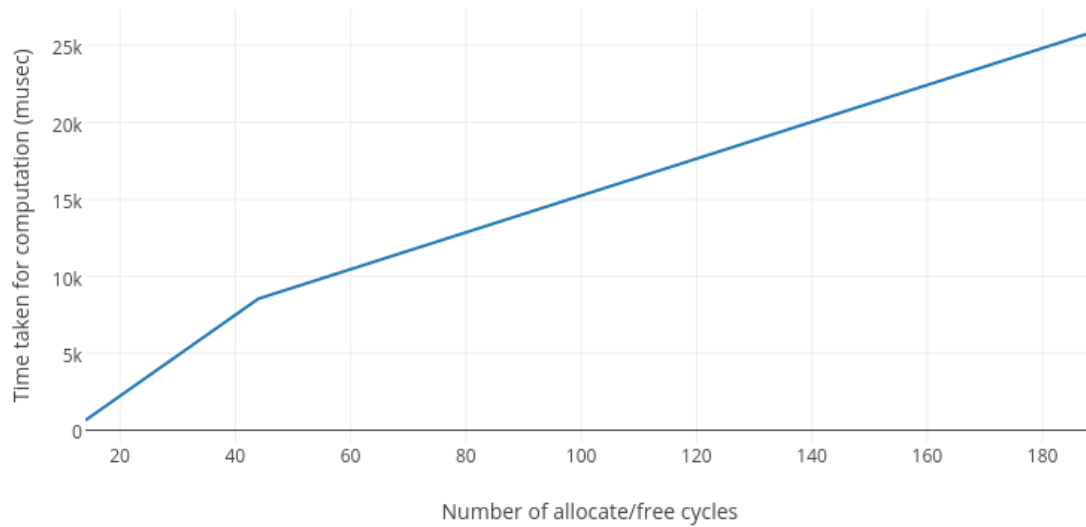
Because memory block sizes must be a power of two with a minimum size defined by the variable *BASIC\_BLOCK\_SIZE*, if you try to allocate something in our buddy-system memory allocator (i.e. 4096 K), the allocation size + *BASIC\_BLOCK\_SIZE* (5012 K) will be rounded up to the nearest power of two and get assigned a 8192 K block – this leads to internal fragmentation, where there is wasted memory inside a block, not wasted space between blocks.

As you increase the numbers of allocate/free operations, the time taken for computation increases. An area of performance improvement of the BBS would be to reserve an index in the free list or another free list entirely that would hold block sizes that are frequently requested. This results in a “best-fit allocation strategy” for blocks sizes that are frequently requested, while using something else for uncommon block sizes – this separate free list would allow blocks of that size to be de-allocated and reallocated with minimum effort.

Alloc/Dealloc Performance for a(1,1), a(1,3), a(1,8)



Alloc/Dealloc Performance for a(2,1), a(2,3), a(2,8)



Alloc/Dealloc Performance for a(3,1), a(3,3), a(3,8)

